GEORGE MASON UNIVERSITY (GMU)
COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT (CEHD)
Division of Elementary, Literacy and Secondary Education

EDPD502.6R5: Learning and Doing Mathematics in Grades 3-5
Spring, 2017
Wednesdays 4:30 – 7:30, January 11 – April 19, 2017
Saturday, 8:00 – 1:00, March 4, 2017
Old Admin. Bldg., room 203 A/B
Prince William County Schools

Instructor: *Kathleen Stoebe*
Phone: *703-791-7248*
E-mail: *stoebekp@pwcs.edu*
Address: *PO Box 389*
    Manassas, VA 20108

Co-Instructor: *Kelly Pratte*
Phone: *703-445-0930*
E-mail: *prattekj@pwcs.edu*
Address: *PO Box 389*
    Manassas, VA 20108

COURSE DESCRIPTION:
Focusing on place value, multiplication, division, and fractions (including decimals), this course empowers teachers to teach mathematics for understanding using a variety of strategies to support a range of learners in an elementary school classroom.

COURSE PURPOSE AND INTENDED AUDIENCE:
Results of national and international tests in mathematics achievement point to the need for reform in mathematics education for elementary students. This course is designed to increase teachers' knowledge of mathematics and the hierarchy of sophistication of children's strategies in place value, multiplication and division, and fractions. Teachers will develop ease with an assessment to diagnose difficulties in mathematics and strategies to remediate these difficulties. The intended audience is teachers or administrators at the elementary school level.

COURSE FORMAT:
Class meetings will be structured for maximum teacher participation. Each class will begin with discussion of mathematical topics and readings. The focus of the mathematical content will be based on the readings assigned. Mathematical problems, activities and lessons supporting these concepts will be modeled, practiced and discussed.

STUDENT OUTCOMES:
Teachers will:
- Have a working knowledge of an instrument to determine students' mathematical knowledge and strategies used to solve problems in the areas of place value, multiplication and division, and fractions.
- Focus their attention on strategies students use to solve problems.
- Shift their focus from teacher activities to student learning.
- Increase their own content knowledge of the mathematics they teach at the elementary school level.
- Learn strategies to teach, remediate, and enrich the concepts of place value, multiplication and division, and fractions (including decimals).

REQUIRED/SUPPLEMENTAL/RECOMMENDED TEXTS AND/OR READINGS:
Required Texts:
Teaching Student Centered Mathematics: Developmentally Appropriate Instruction for Grades 3-5, by John Van de Walle, Karen Harp, LouAnn Lovin, and Jennifer M. Bay-Williams

Supplemental Readings:
Selected articles pertaining to early mathematics acquisition and instruction from a variety of sources including: *Teaching Children Mathematics, Journal for Research in Mathematics Education.*

COURSE REQUIREMENTS, PERFORMANCE-BASED ASSESSMENTS, EVALUATION CRITERIA, AND GRADING SCALE:
1. **Attendance and Class Participation**: Attend and participate in all class sessions. Repeated absences will be reflected in the course grade. Complete all readings for class discussions and participate in all discussions and activities. (5 points per class)
   a. Expectation: We have much to offer and learn from one another; therefore, active and respectful participation of all class members is crucial to the success of this course. Class discussion and activities cannot be reproduced. Participants in this class must be in attendance and on time for the entire class session in order to actively contribute to the enhancement of each session.
   b. Note: failure to attend more than 20% of the classes will result in failure (F) of the course.

2. **Article and Chapter Reflections**: Read and respond to all reading assignments. (10 points each)
   a. Expectation: Reflections will include relevance to the teacher's professional growth, possible changes in student behavior, and mathematical growth that might occur if ideas in the readings are implemented. All points in reflections must be supported informally, by references from the article. Activities are to be explored independently and noted as part of the reflections.
   Reflection format:
      i. At least two pages, double spaced
      ii. Margins should be no wider than 1.25 inches
      iii. Font size - 12
      iv. Font Type – Times New Roman or Ariel

3. **Math Happenings:** Collaborate with at least one other classmate to present a recent math article or math resource for approximately 10 minutes of class time. (5 points)
    a. Expectation: Each teacher will sign up for a class date with at least one other classmate. Together, the teachers will collaborate on a topic or theme. The short presentation could include a summary of a book or an article, a new website discovered that would be good for the group to explore, an idea for an activity for a specific topic in the curriculum, a classroom activity you have observed or have used in your classroom, or anything related to math or math instruction.
    b. Each teacher should equally share the talking time in front of the group.
    c. Handouts are optional.

4. **Inquiry-based lesson plan and summary of lesson:** (60 points) Choose an inquiry-based lesson, write a lesson plan for this lesson as well as a reflection upon completion of the lesson.
    a. Expectation: Lesson plan will be completed on the template provided. Reflections will be an informal description of the actual lesson after it was taught. Particular emphasis should be placed on the teacher's professional pedagogical growth, e.g. what was surprising and what would need to be done differently if he/she taught this lesson again. Student work samples will be included.

5. **Assessment Videos**: Each teacher will videotape themselves administering the assessment and share this videotape with other teachers in class. (20 points each)
    a. Videotapes will also be used to practice evaluating student Math Intervention levels.

6. **Exit Tickets:** Responses to given prompts related to class activities and lessons will be expected at the end of each class. (5 points each)
    a. Responses will focus on thoughts about mathematics and changes in viewpoints or approaches to teaching mathematics. Observations and thoughts about classroom discussions may be included. Teachers should anticipate spending at least 10 minutes writing at the end of each class period.

Formula for Grading:
Percentages based on total possible points throughout the course.
A 90% - 100%
B 80% – 89%
C 70% - 79%
F below 70%

Late assignments will only be accepted the class session following the one where the assignment was due.

COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT STATEMENT OF EXPECTATIONS:
The Graduate School of Education (GSE) expects that all students abide by the following:

Students are expected to exhibit professional behavior and dispositions. See gse.gmu.edu for a listing of these dispositions.

Students must follow the guidelines of the University Honor Code. See http://www.gmu.edu/catalog/apolicies/#TOC_H12 for the full honor code.

Students must agree to abide by the university policy for Responsible Use of Computing. See http://mail.gmu.edu and click on Responsible Use of Computing at the bottom of the screen.

Students with disabilities who seek accommodations in a course must be registered with the GMU Disability Resource Center (DRC) and inform the instructor, in writing, at the beginning of the semester. See www.gmu.edu/student/drc or call 703-993-2474 to access the DRC.

PRINCE WILLIAM COUNTY SCHOOLS MATH DEPARTMENT STATEMENT OF RESPONSIBILITY:

Teachers taking graduate level classes paid for by the PWCS Math Department will be expected to attend all classes and to complete all assignments. Anyone dropping a class after it has started, failing a class, or not attending after registering in the online catalogue will not be permitted to take any other class paid for by the Mathematics office. Dropping a class from the online catalogue must occur at least 48 hours prior to the start of the first class or this penalty will be in effect.

If, for some extraordinary reason, it is necessary to drop the class after it has begun, GMU withdrawal procedures must be followed. Failure to drop with GMU within their guidelines will result in an F for the class.

3/24/2017

Class Schedule
Learning and Doing Mathematics in Grades 3-5

Class	Date	Focus	Topic	Readings/Assignments (for the next class)
1	1/11	**Whole numbers:** Number and Operation Sense:	• Course Introduction • *Teaching Student Centered Mathematics* (TSCM) Chapter 1: Teaching Mathematics for Understanding	TSCM chapter 2, pp. 13-27 TSCM chapter 3, pp. 28-40
2	1/18	**Whole numbers:** Problem Solving, Number and Operation Sense,	• Problem Solving (chapter 2) • Introduce Inquiry-cycle and the Three-Phase lesson plan template • Number and Operation Sense (chapter 8)	TSCM chapter 8, pp. 100-107 TSCM chapter 10, pp. 151-168 **Note**: Begin gathering resources and ideas for inquiry-based lesson.
3	1/25	**Whole numbers:** Number and Operation Sense, Place Value	• Learn how to do Assessment #1 (Place Value) • Continue Place Value concepts – activities from chapter 10	Video Assessment #1 (Place Value) TSCM chapter 9, pp. 127-138
4	2/1	**Whole numbers:** Addition and Subtraction	• View and discuss video: Assessment #1 (Place Value) • Computational Fluency: Addition and Subtraction	TSCM chapter 11, pp. 171-180 TSCM chapter 9, pp. 138-148
5	2/8	**Whole numbers:** Multiplication	• Basic multiplication facts • Building strategies for multiplication • Follow-up on inquiry-based lesson assignment	TSCM chapter 11, pp. 180-188
6	2/15	**Whole numbers:** Multiplication	• Computational Fluency: Multiplication • Learn how to do Assessment #2 (multiplication and division)	Video Assessment #2 (Mult./Div.)
7	2/22	**Whole numbers**: Division	• View and discuss video: Assessment #2 (Mult./Div.) • Building strategies for division	TSCM chapter 4, pp. 41-54 Work through Division ppt article
8	3/4 (Sat.)	**Math Professional Development Day**	• BNVCTM Conference – Attendance required	Write reflection on conference Inquiry-based lesson plan (Part 1)
9-10	3/8	**Rational numbers:** Fractions – Number sense	• Continue division • Begin fraction number sense	TSCM chapter 12, pp. 202-217

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Class	Date	Focus	Topic	Readings/Assignments (for the next class)
11	3/15	**Rational numbers:** Fractions – Number Sense	• Continue Fraction Number Sense • Learn how to do Assessment #3 (Fractions)	TSCM chapter 12, pp. 217-228 Video Assessment #3 (Fractions)
12	3/22	**Rational numbers:** Fractions – Adding/ Subtracting	• View and discuss video: Assessment #3 (Fractions) • Fractions: Addition and Subtraction	TSCM chapter 13, pp. 231-242 (+/–)
13	3/29	**Rational numbers:** Fractions **(cont'd.)** Decimals	• Fraction number sense and computation activities (Math Workshop) • Introduce decimal number sense	TSCM chapter 14, pp. 256-269 *Lesson presentations due on 4/19
14	4/5	**Rational numbers:** Decimals – Adding/ Subtracting	• Decimal computation – addition and subtraction • Decimal computation – multiplication	TSCM chapter 14, pp. 269-273 (no reflection due)
15	4/19	**Rational numbers:** Decimals – Multiplication	• Lesson presentations	
	4/26		Snow date	

Grading Rubric for Reflections on Reading Assignments

	No Evidence 0	Beginning 1	Developing 2	Accomplished 3
Criteria: Reflection on **professional growth**.	No evidence of reflective thought about effect on **professional growth**.	Slight evidence of reflective thought about effect on **professional growth**.	Evidence of reflective thought about effect on **professional growth**.	Evidence of deep reflective thought about effect on **professional growth**.
Criteria: Reflection on possible **student mathematical growth** if ideas expressed in reading are implemented.	No evidence of reflective thought about effect on **student mathematical growth**.	Slight evidence of reflective thought about effect on **student mathematical growth**.	Evidence of reflective thought about effect on **student mathematical growth**.	Evidence of deep reflective thought about effect on **student mathematical growth**.
Criteria: Knowledge of content and mathematical reasoning in working through the **math activities** within the assigned reading.	No references to any of the **math activities** within the assigned reading.	References to few of the **math activities** within the assigned reading.	References to some of the **math activities** within the assigned reading.	References to most/many of the **math activities** within the assigned reading.

	Not Satisfactory 0			Satisfactory 1
Criteria: Writing is coherent and follows guidelines outlined in syllabus.	Written work is not coherent **or** does not follow guidelines outlined in syllabus.			Written work is coherent and follows guidelines outlined in syllabus.

COMMENTS: SCORE: _____ / 10